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Atomic collective excitations in liquid lead

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Abstract

© 2014, Pleiades Publishing, Inc. The atomic dynamics of liquid lead at the temperature T = 600 K has been simulated on the basis of the embedded atom model potential (the “embedded” atom model making it possible to effectively take into account the many-particle interactions) in order to study the mechanisms of formation of the atomic collective excitations. Spectra of the dynamic structure factor S(k, ω) and the spectral densities of the time correlation functions of the longitudinal (formula presented.) (k, ω) and transverse (formula presented.) (k, ω) currents have been calculated for the wavenumber region 0.11 Å−1 ≤ k ≤ 2.01 Å−1. It has been established that the dynamics of density fluctuations is characterized by two dispersion “acoustic-like” branches of the longitudinal and transverse polarization.

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